

W5YI

Nation's Oldest Ham Radio Newsletter REPORT

Up to the minute news from the world of amateur radio, personal computing and emerging electronics. While no guarantee is made, information is from sources we believe to be reliable. May be reproduced providing credit is given to The W5YI Report.

Fred Maia, W5YI, Editor, P.O. Box 565101, Dallas, TX 75356-5101

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ARRL Files Automatic Control HF Packet Petition

"There is a need to restrict automatic HF digital communications to specific, mandatory subbands in order to avoid interference to users of other modes in the crowded HF bands." [ARRL petition]

On February 1, 1993, the American Radio Relay League formally requested a final extension of the *Special Temporary Authority* (STA) which currently authorizes certain amateur radio stations to conduct HF digital communications under automatic control. The present STA was first issued July 7, 1987 and has been extended five times. It expired on February 3, 1993.

The League asked, however, that the STA's termination be delayed until the FCC acts on their Petition for Rulemaking (also filed February 1st) proposing permanent rules governing HF data operation under automatic control. The ARRL said they "...firmly believe that the petition will be supported by the amateur radio community as a reasonable accommodation for all concerned..."

The petition, which has not yet been assigned a Rule Making file number, seeks to permit automatic control of RTTY and data communications in certain small segments of 10, 12, 15, 17, 20, 30, 40 and 80 meter ham bands. The ARRL said internationally agreed upon band plan changes made the proposal both workable and acceptable to the majority of ham operators.

The League's extremely very well done petition runs to some 35 pages. The following is a capsule version of the points made by the ARRL.

(1.) The League's goal in submitting the petition is to encourage experimentation, development and refinement of modern automatically controlled data communications ...and to improve emergency and public service communications.

(2.) The National Telecommunications and Information Administration agrees that the Amateur Service performs an vital role in adapting complicated and expensive technologies to useful communications systems. NTIA is the White House advisor on telecommunications matters. Digital communications networks are advancing at a rapid pace.

(3.) Current data operation in the HF bands includes RTTY, AMTOR, and packet radio. The Amateur Service also is experimenting with such new spectrum-efficient error-correcting digital modes as "Clover" and "Pactor."

(4.) The current rules do not permit automatic networking below 50 MHz and third party communications must use the AX.25 packet protocol. This requirement was based on an ARRL proposal ...although many amateurs also want automatic high frequency networking authority as well.

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(5.) The FCC was properly concerned that automatic "robot" stations will interfere with locally controlled users on the high frequency bands. Several petitions for reconsideration were filed. The ARRL suggested that a small group of data communications enthusiasts determine the feasibility of permanent HF data communications.

(6.) The first STA request was granted in 1987 for a six month period and has been renewed ever since. HF packet works well, moves traffic - and with careful frequency selection provides a public service without undue interference to other amateur activities. But HF packet radio is not compatible with other modes and need separate frequencies.

(7.) The League proposed a plan (RM-7248) in early 1990 that would permit automatically-controlled HF data communications based on a new IARU Region 2 regional band planning effort.

The International Amateur Radio Union (IARU) is the worldwide union of national amateur radio societies. It is an international organization that is recognized by the ITU as representing the amateur and amateur-satellite services and the more than two million radio amateurs throughout the world. It is comprised of 126 member-societies and is organized into three Regions corresponding with those of the ITU.

The ARRL petition was withdrawn two months later to consider other options for automatic control. These options would be developed through the work of a committee of interested amateurs.

(8.) A January 1992 QST survey on automatic digital communications gathered more than 500 responses which were considered by the League's Board of Directors at their meeting in July. It was clear that there should be no band-wide automatic control of HF digital messaging ...any such operation should be within specific subbands. "The League was faced with the dilemma of its obligation to comply with the band plan for such established by international agreement, and the rejection of the same by United States amateurs."

(9.) The ARRL Board elected to support a plan which would not permit automatic HF data communications between, or among, themselves. Rather such stations would be limited to communications with stations under local control. The compromise semi-automatic control was criticized as unworkable and unacceptable by HF packeteers.

(10) Once again the League's Executive Committee asked the Digital Committee to look into the issue. A meeting was held between the Digital Committee and representatives of the HF packet community in late September 1992.

(11.) A meeting of the IARU Region 2 General Assembly (held in Curacao, Netherlands Antilles) just before the September 26th meeting between the Digital Committee and HF packet enthusiasts produced

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another - substantially revised - HF band plan - including segments for automatically controlled data communications.

(12.) The new IARU band plan provides segments on each amateur HF band for digital modes including RTTY, AMTOR, packet - defined as including new systems such as Clover and Pactor - but excluding facsimile and SSTV. CW would continue to be permitted throughout all amateur bands.

(13.) The League now recommends that:

- (a.) Amateur stations may be operated under automatic control using any accepted protocol for data transmissions within certain small frequency segments;
 - (b.) Such stations should be equipped with a means to limit transmissions to no more than five minutes in the event of an equipment malfunction or interruption of contact with another station;
 - (c.) Third party communications may be transmitted under automatic control, using any authorized emission mode [Baudot, AMTOR, ASCII] provided that the retransmitted messages must originate at a station that is being locally or remotely controlled;
 - (d.) HF data operation should be permitted outside those specified subbands only under local control;
 - (e.) The rule which prohibits automatic control while transmitting third party traffic (except packet stations using the AX.25 protocol on the 6-meter and shorter wavelength bands), should be changed so as to permit RTTY and other data modes under automatic control on HF frequencies as well as at VHF and above.

ARRL recommends the following new Part 97 wording:

Section §97.109 Station Control.

- (d) When a station is being automatically controlled, the control operator need not be at the control point. Only stations transmitting RTTY or data emissions, and stations specifically designated elsewhere in this Part, may be automatically controlled. Automatic control must cease upon notification by an EIC (Engineer-In-Charge) that the station is transmitting improperly or causing harmful interference to other stations. Automatic Control must not be resumed without prior approval of the EIC. RTTY and data stations operating under automatic control on frequencies below 50 MHz must use a digital code permitted in §97.309(a) [Baudot, AMTOR or ASCII] of these Rules, and must incorporate provisions for discontinuing transmitter operation in the event of malfunction, or interruption of communications with another station.

(1.) Stations transmitting RTTY or data may be operated under automatic control in the 6 meter and shorter wavelength bands: 28.120-28.189 MHz;

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24.925-24.930 MHz; 21.090-21.100 MHz; 18.105-18.110 MHz; 14.095-14.0995 MHz; 14.1005-14.112 MHz; 10.140-10.150 MHz; 7.100-7.105 MHz; or 3.620-3.635 MHz.

- (2) Stations authorized by these rules to transmit RTTY or data communications under automatic control may transmit third party communications. Any retransmitted messages on behalf of any third party must originate at a station that is under local or remote control.

SAREX TO CONDUCT ANTENNA GAIN EXPERIMENT

The STS-55 space shuttle Columbia flight is still set for a February 25th launch at 15:20 UTC. STS-55 - which carries the SAREX (Shuttle Amateur Radio Experiment) - is a 9 day mission with a low inclination orbit. This mission is the first spacelab module flight of 1993. It is designated SL-D2 and represents the second in a series of dedicated flights for Germany. The primary goals of this mission are to perform studies in materials and life sciences research.

SAREX configuration "C" was selected for this mission. This configuration includes 2-meter FM voice and packet radio communications. Four (and hopefully, five by lift-off) of the seven STS-55 crew members are licensed hams. These include Spacecraft Commander Steve Nagel, N5RAW, Mission Specialist Jerry Ross, N5SCW, German Payload Specialist H- Schlegel, DG1KIH, and German Payload Specialist Ulrich Walter, DG1KIM. Charles J. Precourt is still waiting for his Technician ticket to arrive - he passed his exam in December. The primary voice call sign will be N5RAW. The packet radio call sign for this and all missions in 1993 is W5RRR-1.

In addition to the U.S. SAREX ham gear in the Shuttle mid-deck, an additional ham radio station will be flown in the German Spacelab module. This station, designated SAFEX (Spacelab Amateur-Funk-Experiment), includes 2-meter FM downlink and 70-cm FM uplink capability. A dual-band (VHF/UHF) external antenna mounted on the German spacelab module will be used for SAFEX contacts. Payload Specialists Schlegel and Walter expect to make a few scheduled contacts with European schools with this equipment.

The externally mounted SAFEX antenna gives the SAREX team a unique opportunity to compare the performance of the U.S. SAREX window mounted antenna to an externally mounted antenna. A special antenna test is planned on orbits 61 and 62 using the normal SAREX downlink frequency, 145.550 MHz. During orbit 61, the shuttle crew will transmit using the SAREX window mounted antenna. On orbit 62, the crew will transmit using the externally mounted SAFEX antenna.

Members of the Motorola Amateur Radio Club in Florida will conduct extensive field strength measurements during the two passes to evaluate antenna

system performance. Amateurs in Louisiana, Mississippi, Georgia and Florida are being asked to help participate in this test by making signal strength readings of the received signal for both orbit passes. A SAREX Antenna Test Report Package from the ARRL Educational Activities Department, ARRL, 225 Main St., Newington, CT 06111. Please include a large S.A.S.E.

FCC JUDGE DENIES LEGAL FEE REIMBURSEMENT

Charles Pascal, WB5CIY (Carson City, Nevada) and **Sandra V. Crane, N6TFO** (Marina Del Rey, CA) have had their *"Request for Award Under Equal Access to Justice Act"* denied by the FCC. On November 4, 1992, both Pascal and Crane applied for a reimbursement of all costs associated with their legal case which involved questionable amateur radio teaching and testing practices. Crane was the owner of the California Amateur Radio School; Pascal an instructor.

The FCC ordered both Pascal and Crane last April to "Show Cause" why their Amateur Radio licenses should not be revoked for tailoring the content of their amateur radio license class instruction to include answers to questions which were on the license examinations and administering examinations to family members (in this case Crane's daughter.)

Pascal and Crane requested a hearing which was scheduled for Sept. 29, 1992, in Washington, DC. Prior to the hearing, however, a settlement was reached whereby both Pascal and Crane agreed to a 3 month suspension of their operator licenses.

Also as a result of the suspension, both Pascal and Crane lost their eligibility to be Volunteer Examiners in the VEC System and Novice testing programs. Section §97.515(c) provides "No person may be a VE if that person's amateur station or operator license has ever been revoked or suspended." In addition, it was agreed that a "wall" would exist between their teaching function and the selection of VEs to test their students. In pre-hearing written statements, both Crane and Pascal admitted that they were involved in examination irregularities.

The *Equal Access to Justice Act* (EAJA) provides for the award of attorney's fees and other expenses to an eligible party "...when it prevails over the Commission..." Administrative Law Judge Joseph Chachkin ruled that Crane and Pascal failed to meet their burden of demonstrating that they are the prevailing parties in this proceeding. Crane and Pascal argued that they more or less won the case because their Amateur licenses were not revoked as initially sought by the FCC. The judge ruled that by agreeing to a 3-month suspension of their amateur licenses both Crane and Pascal failed to satisfy their claim that they are the prevailing parties and that the FCC's Private Radio Bureau accomplished their goal of controlling their questionable teaching/testing activity.

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MIAMI HAMFEST ATTRACTS BIG CROWD!

Over 11,000 radio and computer enthusiasts attended the 33rd Annual Tropical Hambooree held in Miami, FL, the weekend of Feb. 6 and 7. Big signs out front called it a *Amateur Radio and Computer Show* and we chatted with hundreds of attendees who were computer fanciers - but not licensed amateurs. They seemed to be particularly interested in "radio modems" (packet radio) and the two giant indoor flea markets which had more computer stuff than ham "junque." All exhibitors seemed very pleased with their sales results! Although worn to a "frazzle," General Chairman (chairlady?) *Evelyn Gauzens, W4WYR*, and company did an outstanding convention production job!

The Friday evening *Amateur Radio Industry Group* (ARIG) meeting held at the Airport Marriott heard ARRL's Educational Activities Manager *Rosalie White, WA1STO* give a report on League efforts to promote ham radio to the public. She talked about the Archie comic book aimed at introducing ham radio to youngsters and said the number of kids 18 and under who are licensed now stands at 21,673 - a 67% increase over just three years ago. A January survey showed that the Archie comic book is indeed familiarizing youngsters with amateur radio. There were 48,984 newcomers to ham radio during the last fiscal (October 1991 to September 1992) year.

"Although the initial surge is over..." Rosalie said 13,333 people contacted the League last year for information about "...the new [codeless] license." Three hundred schools and museums have written the League for SAREX lesson plans. "About one third of these are schools without licensed teachers." ARRL also plans amateur radio information booths at the upcoming *National Science Teachers Association* and the national convention of the *International Technology Education Association*.

Dave Sumner, K1ZZ (League Executive VP) is interested in hearing from any manufacturer who is thinking about commercial products for 2.3 gigs and above. He and Jon Bloom of our technical staff would like to talk to them about the satellite program and microwave aspects," Rosalie said.

ARIG president, *Mike Forsyth, N7KQE*, discussed an ambitious plan to add five top-notch professionally-produced "HamShows" to the amateur radio convention schedule. The first will be held in the Philadelphia vicinity this August 21 and 22 at the Valley Forge Convention Center. In 1994, "HamShows" will be added to the Boston/Hartford area, Chicago, San Francisco and Los Angeles. The "HamShow" conventions will be produced in association with CQ Magazine.

The *Ham Radio Business Council* has a new president! He is well known *Bill Pasternak, WA6ITF*, who said he made the mistake of going to the bathroom and found out he had been elected when he got back!

• The FCC has fined *William A. Moskowitz, KA3HSZ, of Plano, Texas*, \$2,000 for intentionally jamming 14.313 MHz. The Jan. 14th Notice of Apparent Liability said its Vero Beach, FL, monitoring station heard Moskowitz deliberately change frequency twice "...in order to interfere with on-going communications. The violation was willful." He could have been fined \$7,000. Moskowitz has 30 days to pay up ...or appeal.

• *Eric Archer, WB6GYD* - assisted by Pino, IØDUD and Tony, IØJX - plan a "summer" *Satcom DX-Pedition to HV3SJ, The Vatican*, which has never been active on any amateur satellite. Eric expects to operate several satellites - including AO-10, 13, 20, 21, RS ...and in several (A, B, J, K, L, S) modes.

AMATEUR RADIO CALL SIGNS

...issued as of the first of February 1993:

Radio District	Gp."A" Extra	Gp."B" Advan.	Gp."C" Tech/Gen	Gp."D" Novice
0 (*)	AAØLH	KGØDI	NØVHH	KBØKYS
1 (*)	AA1FD	KD1MU	N1OFW	KB1AQ
2 (*)	AA2MK	KF2MW	N2TPL	KB2PV
3 (*)	AA3DE	KE3GQ	N3OCP	KB3AO
4 (*)	AC4ZT	KQ4NA	(**)	KD4WL
5 (*)	AB5KI	KJ5HW	(**)	KB5YJ
6 (*)	AB6QH	KN6GJ	(**)	KD6RV
7 (*)	AA7TO	KI7JT	(**)	KB7SG
8 (*)	AA8JU	KF8YV	N8WXO	KB8OQ
9 (*)	AA9FT	KF9NF	N9SDT	KB9IJP
N. Mariana Is.	AHØQ	AHØAM	KHØAZ	WHØAAT
Guam	NH2M	AH2CS	KH2GO	WH2AN
Johnston Is.	AH3D	AH3AD	KH3AG	WH3AAG
Midway Is.		AH4AA	KH4AG	WH4AAH
Hawaii	(*)	AH6MH	WH6KL	WH6CQE
Kure Is.			KH7AA	
Amer. Samoa	AH8G	AH8AE	KH8AI	WH8ABB
Wake W. Peale	AH9C	AH9AD	KH9AE	WH9AAI
Alaska	(*)	AL7OO	WL7IK	WL7CGP
Virgin Is.	NP2W	KP2CA	NP2GI	WP2AHU
Puerto Rico	(*)	KP4UQ	(***)	WP4LTF

CALL SIGN WATCH: * = All Group "A" 2-by-1 "W" pre-fixed call signs have been assigned in these radio districts. Group "A" 2-by-2 format call signs are now being assigned to Extra Class amateurs.

** = Group "C" (1-by-3) call signs have now run out in the 4th, 5th, 6th, 7th and Puerto Rico call districts. The next lower Group "D" (2-by-3 format) call signs are now being assigned in these areas.

Upgrading Novices holding a 2-by-3 format call sign in the 4th, 5th, 6th, 7th and Puerto Rico call areas will no longer be able to request a Group "C" call and will be automatically assigned another more recent 2-by-3 format call sign if they do.

[Source: FCC, Gettysburg, Pennsylvania]

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NEWCOMERS GROW BY ANOTHER 5% IN 1992, ...VERSUS A 54% INCREASE IN 1991

The final licensing statistics are in! Nearly 75% of all first time ham operators choose the Code-free Technician path into Amateur radio during 1992. The Novice Class continues to decline with 38% less beginners choosing this route than a year ago.

The number of beginners leaped by 53.8% in 1991 due to the establishment of no-code hamming. In 1992, there was a slight increase: 4.9% (44748 vs. 42660). Here is the final stats over the last 3 years.

Class Newcomers to the Amateur Radio Service

1990

	Jan	Feb	Mar	Apr	May	Jun
Nov	2434	1679	2466	2368	3875	1724
Tech	191	219	205	239	359	214
Other	46	43	56	51	50	46
Total	2671	1941	2727	2658	4284	1984

	Jul	Aug	Sep	Oct	Nov	Dec	Total	Percent
Nov	1665	893	1382	1457	1498	2957	24398	88.0%
Tech	269	158	128	283	182	260	2707	9.8%
Other	69	38	42	86	66	423	635	2.2%
Total	2003	1089	1552	1826	1746	3259	27740	100.0%

Average Newcomers: 2312

1991

	Jan	Feb	Mar	Apr	May	Jun
Nov	1713	1819	1734	2651	1801	1088
Tech	89	307	* 882	3025	2858	2112
Other	14	36	40	73	55	31
Total	1816	2162	2656	5749	4714	3231

(* = First Codeless Technician license issued: 3/12/91)

	Jul	Aug	Sep	Oct	Nov	Dec	Total	Percent
Nov	1662	872	679	1070	813	1270	17172	40.4%
Tech	2932	3180	1680	3354	1815	2608	24842	58.2%
Other	82	69	48	77	59	62	646	1.5%
Total	4676	4121	2407	4501	2687	3940	42660	100.0%

Average Newcomers: 3555 Increase: +53.8%

1992

	Jan	Feb	Mar	Apr	May	Jun
Nov	655	1260	1364	1330	1066	1371
Tech	3318	2764	3347	3810	3058	4525
Other	57	68	95	75	54	61
Total	4030	4092	4806	5215	4178	5957

	Jul	Aug	Sep	Oct	Nov	Dec	Total	Percent
Nov	1024	465	617	456	454	642	10704	23.9%
Tech	2752	2494	2069	1548	1054	2633	33372	74.6%
Other	67	44	46	31	17	57	672	1.5%
Total	3843	3003	2732	2035	1525	3332	44748	100.0%

Average Newcomers: 3729 Increase: +4.9%

(Source: FCC Licensing Facility, Gettysburg, PA)

DECEMBER AMATEUR LICENSING STATISTICS

<u>December</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>
New Amateurs:				
New Novices	1868	2957	1270	642
New Tech's	264	260	2608	2633
Total New:	2170	3259	3940	3322
<u>Upgrading:</u>				
Novices	1168	1326	614	524
Technicians	493	622	**512	**635
Generals	338	398	362	336
Advanced	230	285	273	305
<u>Total:</u>	<u>2229</u>	<u>2631</u>	<u>1761</u>	<u>1800</u>

<u>Renewals:</u>	<u>*</u> 107	<u>*</u> 49	<u>*</u> 50	<u>*</u> 90
Novices	* 13	* 8	* 4	* 35

<u>Purged:</u>	(*=Due to change from 5 to 10 year lic. term.)
Total Dropped:	1048
Novices	381

<u>Census:</u>	<u>Indiv. Oper.</u>	<u>500243</u>	<u>543117</u>	<u>587657</u>
	470792	500243	543117	587657

Change/Year +30481 +29451 +42874 +44540

Individual Operators by Class: (and % of total)

<u>Extra</u>	<u>Advan.</u>	<u>General</u>	<u>Technic.</u>	<u>Novice</u>	<u>Total:</u>
December 1989					

50324	102141	117153	115427	84747	470792
10.7%	21.7%	24.9%	24.5%	18.2%	100.0%

December 1990

53836	105309	119796	127427	93875	500243
10.8%	21.0%	23.9%	25.5%	18.8%	100.0%

December 1991

57488	107642	122592	158041	97354	543117
10.6%	19.8%	22.6%	29.1%	17.9%	100.0%

December 1992

61319	109882	125207	192184	99065	587657
10.4%	18.7%	21.3%	32.7%	16.9%	100.0%

Club/ RACES & Military:

	<u>(1989)</u>	<u>(1990)</u>	<u>(1991)</u>	<u>(1992)</u>
Military:	2459	2434	2431	2431
Total Active:	473251	502677	545548	590088

% Increase +6.9% +6.2% +8.5% +8.2%

(** = Does not include Technicians upgrading to Tech Plus)

NUMBER OF AMATEURS BY CALL SIGN GROUP:

<u>Group</u>	<u>Extra</u>	<u>Advan.</u>	<u>General</u>	<u>Technic.</u>	<u>Novice</u>	<u>Total</u>
A	34963	684	249	7	0	35903
B	3797	28584	54	6	1	32442
C	14088	43842	67282	86229	48	211489
D	8224	36655	57516	105879	99014	307288
Other	247	117	106	63	2	535

Total 61319 109882 125207 192184 99065 587657

[Group "A"=2X1 & 2X2; "B"=2X2; "C"=1X3 "D"=2X3 format.]

(Source: FCC Licensing Facility, Gettysburg, PA)

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- **Morse code dead?** Both the IMO (International Maritime Organization which controls shipping on the high seas) and now the Coast Guard are discontinuing manual CW. "Effective August 1, 1993, all U.S. Coast Guard Communications Stations and Cutters will discontinue watchkeeping on the distress frequency 500 kHz and will cease all Morse code services in the medium frequency radiotelegraphy band." (Excerpted from *Notice to Mariners*, Jan. 5, 1993, U.S. Coast Guard.)

- **On January 14, the FCC allocated spectrum below 1 GHz for low-earth-orbit (LEO) mobile satellites** and has proposed flexible rules to govern a new generation of satellites capable of providing low cost data, messaging and position location services on a global scale. LEO licensees will be able to work in conjunction with any common carrier or as a private carrier ...and select any modulation scheme.

VHF/UHF LEO satellites, which have travelling elliptical low altitude orbits, collect (uplink) and pass (downlink) communications as they cover the earth. LEO technology was pioneered in the Amateur Service by AMSAT, the *Radio Amateur Satellite Service*. The big advantage of LEO messaging is its lower hardware (both satellite and receiver) and launch cost.

The FCC also affirmed the award of a "pioneer's preference" in the grant of a license to VITA. *Volunteers in Technical Assistance*, a non-profit Arlington, VA, based organization, provides technical assistance to developing nations. Amateur, Gary Garriott, WA9FMQ is its VITA's CEO.

Low-earth-orbiting satellites will operate just below and above the 2-meter ham band at 137 and 148 MHz and in the UHF 400 MHz band. The FCC is also developing guidelines for larger LEO satellite networks to operate above 1 GHz. Several commercial firms are interested in offering the LEO service to the public.

- **You'll never be without a phone if Motorola and Bell Atlantic have their way!** They are launching a test in Pittsburgh of a single-number single-telephone system that acts as a cordless phone in the home, an extension in the office and a cellular phone on the road. It simply goes everywhere you do! The pocket-size handset works in concert with one or two base stations and has such features as selective call blocking, call routing, voice mail and call forwarding. Depending on the number of features, cost is around \$25 a month plus phone toll charges.

- **Part of 220 MHz band goes to assist in emergency situations!** On January 14th, the FCC created a new radio service to be known as the *Emergency Medical Radio Service* (EMRS). Primary users will be rescuers at accident and disaster scenes, physicians in hospitals and other individuals and companies that provide basic or advanced life-support services. Spectrum was taken from the 460 MHz SERS (*Special Emergency Radio Service*) and 5 narrow-band pairs were reallocated from the 220 MHz business band (which was previously reallocated from the Amateur Service.)

- **Tail wagging the dog department! Financially strong Dell Computer must be doing something right!** IBM has hired a new direct response advertising agency to handle its new mail-order personal computer business. *Grey Direct Advertising* will create a new \$15 million campaign for IBM. The \$64.5 billion dollar computer giant lost \$5 billion last year.

Compaq Computer seems to be taking advantage of the recent unrest in the home PC! They are running advertising implying "many" of the larger clone companies "...are about to go under."

Time magazine (Feb. 1 issue) did a very interesting piece on how ten years ago, two little companies (*Intel and Microsoft*) were given

orders by IBM to create microchips and software for them. Now Microsoft and Intel are each worth more than IBM ...and their profits are skyrocketing! Intel income rose 30% last year and Microsoft is up 44%. "...IBM is in danger of being trampled on by the creations it unleashed!"

There is apparently no love lost between IBM and Microsoft! Microsoft developed DOS for IBM and later the PS/2 and its OS/2 operating system. When it failed to catch on, IBM developed its own version of OS/2 which also has failed.

On the other hand, Microsoft's "Windows" is highly successful and they will debut a new "NT (New Technology) for Windows" this Spring - which, among other things, can link many computers together in a network.

IBM is also reducing its dependency on Intel by using chips (in its European low-cost Ambra PC) from Intel competitor, Advanced Micro Devices. And IBM will shortly be competing with Intel by selling its own chips to Intel's customers. The first clone maker to use actual IBM microprocessor and circuit boards will be the CompuAdd Computer Corporation of Austin, Texas. They will market what is essentially an IBM PC. CompuAdd believes this will give them an advantage in compatibility! Intel plans to release its new 100 MHz "Pentium" microprocessor shortly.

Last year, IBM teamed up with Microsoft's and Intel's primary competitors, Apple Computer and Motorola to develop advanced software and microprocessors for a new generation of PC's.

The marketing activities of both Microsoft and Intel, by the way, are being looked at by government regulators to determine if some of their practices stifle competition. Microsoft controls 48% of the \$7 billion worldwide software ...and 90% of the operating system market. And Intel owns 68% of the \$5 billion microprocessor market.

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VEC'S TO REVISE GENERAL CLASS QUESTIONS QPC asks amateur community for their input

The Amateur Service rules (Section §97.523) require that "All VEC's must cooperate in maintaining one question pool for each written element. Those questions must contain at least ten times the number of questions required for a single examination. Each question pool must be published and made available to the public prior to its use for making a question set."

The job of question pool maintenance falls to the VEC's internal **Question Pool Committee** who are elected at their annual conference. The QPC consists of three VEC members who agree to maintain the examination questions for all license classes. The current QPC consists of **Ray Adams, N4BAQ** (Chairman), **Fred Maia, W5YI** (Vice Chairman) and **Bart Jahnke, KB9NM**.

Question pool maintenance consists of developing and periodically revising the various examination elements outlines (syllabus) and individual questions to insure that they properly reflect current technology, government regulations and good amateur operating practices. The amateur community participates in this process. The QPC has already completed revising the Novice and Technician questions and has released these into the public domain. The next question set scheduled for revision is the Element 3B, General Class. The following is the schedule:

Call for input on Element 3B syllabus:	7/1/92
QPC begins work on 3B syllabus:	10/1/92
QPC releases revised 3B syllabus:	2/1/93
Public input on 3B questions:	2/1/93 to 6/30/93
QPC begins work on Element 3B:	7/1/93
QPC releases ASCII copy of 3B questions:	12/1/93
QPC releases written copy of 3B:	1/1/94
Date new 3B study material available:	5/1/94
Revised 3B questions first used in exams:	7/1/94

FCC regulations (Section §97.503) specify that the objective of each written examination is to prove that the applicant has the necessary qualifications to be a control operator for the class of license examined. Each written examination must contain a specified number of questions from each of nine topics. On February 1, 1993, the Question Pool Committee approved revised guidelines for the new Element 3B question pool. This syllabus continues the new system of question numbering originally used in the Novice pool.

Between now and June 30, the QPC will be accepting candidates for new and revised Element 3B (General Class) questions from the public. These should be sent to: **Ray Adams, N4BAQ** (5833 Clinton Hwy #203, Knoxville, TN 37912); **Fred Maia, W5YI** (P.O.

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Box 565101, Dallas, TX 75356) and **Bart Jahnke, KB9NM** (ARRL, 225 Main St., Newington, CT 06111.)

No oral submissions will be accepted. Only one question should be on an 8½" X 11" sheet of paper. Each sheet should contain your name, mailing address, amateur call sign, license class and expiration date. No question may contain more than 250 characters but try limiting to 210 characters. Indicate examination element, subelement and group ...and if a new or revised question. (Specify question being revised.) Please list three suggested distractors (wrong answers), the correct answer and an answer reference. Try to limit each answer/distractor to 140 characters. The reading level should be high school level, Grade 12.

All material submitted to the Question Pool Committee, including questions, answers distractors, illustrations and references, becomes the property of the Question Pool Committee and may be used, modified or rejected as the Committee shall determine. No materials will be returned.

The first digit of the question number indicates the class of license: N = Novice, T = Technician, G = General, A = Advanced, and E = Extra. The second digit of the question number is copied from Section §97.503(c) setting out the number of questions in the respective tests by subject matter: 1 = FCC rules (4), 2 = Amateur station operating procedures (3), 3 = Radio wave propagation characteristics (3), 4 = Amateur radio practices (5), 5 = Electrical principles (2), 6 = Circuit components (1), 7 = Practical circuits (1), 8 = Signals and emissions (2), and finally: 9 = Antennas and feedlines (4). [Digits in parenthesis is the number of questions required from each topic for a valid General Class test.]

Individual question numbers begin with the class, subelement and syllabus topic and end with an individual question identifier of two digits, thus providing a unique number for the question; for example: G1A01, G1A02, G1A03, etc. ...and finally G1J15 (if there were 15 questions in the topic). The rules require that each suggested question be submitted by a licensed amateur holding at least an Advanced Class operator license (see Section §97.507(a)(1)).

Syllabus - Amateur Radio Examination - Element 3B (General class) - February 1, 1993

G1 - Commission's Rules - 4 questions - 4 topics

- G1A General control operator frequency privileges; local control, repeater and harmful interference definitions
- G1B Antenna structure limitations; good

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G1C	engineering and good amateur practice; beacon operation; restricted operation; retransmitting radio signals	sistors, etc.
G1D	Transmitter power standards; type acceptance of external RF-power amplifiers; standards for type acceptance of external RF-power amplifiers; HF data emission standards	
G1D	Element 1A preparation; Element 2 preparation; examination administration; temporary station identification	
	G2 - Operating procedures - 3 questions - 3 topics	
G2A	Phone, RTTY, repeater, VOX, full break-in CW	
G2B	Operating courtesy, antenna orientation and HF operations, including logging practices	
G2C	Emergencies, including drills, communications and amateur auxiliary to FOB	
	G3 - Radio wave propagation - 3 questions - 3 topics	
G3A	Ionosphere disturbances; sunspots and solar radiation	
G3B	Maximum usable frequency, propagation "hops"	
G3C	Height of ionospheric regions, critical angle and frequency, HF scatter	
	G4 - Amateur practices - 5 questions - 5 topics	
G4A	Two-tone test; electronic TR switch, amplifier neutralization	
G4B	Test equipment: oscilloscope; signal tracer; antenna noise bridge; monitoring oscilloscope; field strength meters	
G4C	Audio rectification in consumer electronics, RF ground	
G4D	Speech processors; PEP calculations; wire sizes and fuses	
G4E	RF safety	
	G5 - Electrical principles - 2 questions - 2 topics	
G5A	Impedance, including matching, resistance, including ohm, reactance, inductance, capacitance and metric divisions of these values	
G5B	Decibel, Ohm's law, current and voltage dividers, electrical power calculations and series and parallel components, transformers (either voltage or impedance), sine wave root mean square value	
	G6 - Circuit components - 1 question - 1 topic	
G6A	Resistors, capacitors, inductors, rectifiers, trans-	
		G7 - Practical circuits - 1 question - 1 topic
		G7A Power supplies and filters
		G8 - Signals and emissions - 2 questions - 2 topics
		G8A Signal information, AM, FM, single and double sideband and carrier, bandwidth, modulation envelope, deviation, over-modulation
		G8B Frequency mixing, multiplication, bandwidths, RTTY, FSK, mark, space, shift
		G9 - Antennas and feed lines - 4 questions - 4 topics
		G9A Yagi antennas - physical dimensions, impedance matching, radiation patterns, directivity and major lobes
		G9B Loop antennas - physical dimensions, impedance matching, radiation patterns, directivity and major lobes
		G9C Random wire antennas - physical dimensions, impedance matching, radiation patterns, directivity and major lobes; feedpoint impedance of 1/2-wavelength dipole and 1/4-wavelength vertical antennas
		G9D Popular antenna feed lines - characteristic impedance and impedance matching; SWR calculation

MAJOR PCS SYMPOSIUM HELD IN DALLAS

On February 2, 1993, I attended a high-powered symposium in Dallas entitled "PCS, Position Your Company for the Coming Revolution" sponsored by the Institute for International Research, Inc. IIR is a very large business information company with offices around the world - including Paris, Frankfurt, Milan, Stockholm, Amsterdam, Madrid, Hong Kong, Sydney, Singapore, Toronto, London and New York. Luckily, I was furnished media guest credentials. The two day seminar (which had a price tag of \$1,095.00) had 'The Business Opportunities and Challenges of PCS, Personal Communications Services' as its theme.

Practically every major company involved in PCS was there ...including all of the Regional Bell Operating Companies, AT&T/Bell Labs, Motorola, Bellcore, EDS Personal Communications, McCaw Cellular, NYEX, GTE, Ameritech, U.S. West, Metromedia, and Centel to name a few. Surprisingly, although the personal computer is directly involved, there was not a single PC company in attendance! The symposium was chaired by Wayne Drews, Southwestern Bell's Director of Stra-

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tegic Business Development.

The government was represented by an economist from the *Department of Justice*, a Senior Policy Attorney from the *National Telecommunications and Information Administration* (NTIA is the White House advisor on telecommunications matters) and FCC Commissioner Andrew C. Barrett who was the featured speaker. I saw the name of Chairman Senator Ernest F. Hollings (Democrat-South Carolina; Commerce Committee Chairman) on the speaker's list, but don't know if he addressed the conference as I was not able to stay for all of the presentations. His topic was entitled the "View from the Hill."

Every possible subject was covered including various wireless digital voice, data and video technologies, different methods of spectrum sharing, universal connectivity, wired versus wireless costs, "The Intelligent Network", price points users are willing to pay, what PCS will look like several years from now, telepoint and PCS in the UK and Europe, regulatory concerns, PCS through the cellular and cable network ...and more!

Saying he firmly believes that the role of a telecommunications regulator should "...evolve toward providing sufficient regulatory flexibility for technological advancement and market activity, protecting the public from market abuses, and providing a regulatory framework that permits choices among a variety of competitive service providers," FCC Commissioner Barrett outlined his vision of the telecommunications marketplace of the near future and how regulation must adapt to it.

Commissioner Barrett noted that it has been estimated that the future wireless communications services market in the United States could grow to more than 60 million subscribers by the year 2000 spending \$20 to \$30 per month for mobile wireless services. Today, cellular is approaching approximately nine to ten million subscribers nationwide.

He envisioned the FCC's role in molding the telecommunications of the future would be more in the area of overseeing a wide variety of competitive technologies rather than monitoring large monopolies and their pricing policies. The FCC will strongly support entrepreneurial effort "...people that may not have the money or a lot of employees, but have an idea." Telcos and cellular interests will be joined by cable, utilities and PCS "ventures." Barrett noted that the first PCS "pioneer preference" licenses are being awarded to a cable company, a PCS startup firm and a mobile microwave equipment company ...and not to such traditional communications providers as telephone and cellular. "I don't accept that our salvation is dependent upon large companies."

Barrett said the FCC was moving ahead as quickly

as possible to develop PCS rules in the 2 GHz and 900 MHz bands. The FCC is also proposing a 20 MHz segment between 1910 and 1930 MHz to be allocated to 55 channels (of varying bandwidth) for unlicensed PCS services. Computer companies are particularly interested in this concept to develop local and wide area networks. Users will not have to subscribe to network service run by a licensed company; they will be able to establish their own wireless networks. PC's will be able to be moved, or laptops used, without the need for hard wiring. "If computer companies can harness spectrum to provide multimedia, interconnective computer functions, this development alone could have a significant impact on the future growth of the personal computer market and private business loops."

Commissioner Barrett said that the FCC was looking into the administration of the North American Numbering Plan. "Clearly if there is to be truly portable, seamless PCS and LEO (low-earth-orbit satellite) services, a database must exist which supports (user) number portability among multiple vendors and service areas."

He said state and federal regulators will face tough issues as we move toward the new ideal of a network of networks. All conflicting issues must be addressed and solved in a methodical and forthright manner. "Unlike the period during the late 1970's and early 1980's, this country and the economy cannot afford additional, undue delays in offering new (communications) services. The world is a more competitive place, and we must all adjust to the implications of that fact in our daily lives."

The subject of RF health hazards came up during the question and answer period that followed Barrett's address. It seems that a Florida man alleges that his wife's fatal brain cancer was caused by a hand-held cellular phone. This was written up in the national newspaper, *USA Today*, the day that the symposium began. Although there continues to be no conclusive link between radio frequency energy and cancer, Barrett said he was concerned about the adverse publicity. He compared it to the Tylenol scare of several years ago. Barrett said he did not know if there was anything to it, but that he knew smoking was bad for your health and he was not quitting. The unsaid implication was that people would continue to use their cellular telephones if it answered a need.

I asked Barrett how much time did the Commissioners spend on Amateur Radio Service rulemaking and he admitted not much. He said he relied on his immediate staff which consisted of lawyers and economists. "I try to learn from them as much as I can about the issues."

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REPORT ON ADVANCED INTERACTIVE VIDEO

Time-Warner has unveiled what it calls the world's first full-service cable television network. The "early 1994" test will serve 4,000 customers in an Orlando, Florida, suburb. **"Full Service Network" (FSN) TV** will deliver interactive voice and data services, pay-per-view sports, games, home shopping, instantaneous movies-on-demand, picture-phone and other PCS (personal communications services).

The service will also feature on-demand and targeted advertising. Consumers will be able to access wanted ads for various products ...and advertisers can target specific households. Separate messages can even be sent to every television. Home shoppers will browse in specific departments of specific stores, view live-action product demonstrations and order merchandise from their living room.

Time Warner's project will use a hybrid system of "fiber optic-to-the-curb and copper-to-the-home" [sounds like lyrics of a song!] ...and high-technology digital compression, advanced digital switching and ultra high-capacity storage. FSN equipped homes will have a home storage box capable of holding a thousand gigabytes [an inconceivable million megabytes!] of digital information which will be downloaded in bursts for immediate or later access. No equipment or subscriber cost estimates were released by Time Warner raising a serious question of consumer "cost effectiveness."

The Regional Bell Operating Companies (local telephone, RBOC) are also working with Congress in an attempt to get permission to own cable systems and offer video programming and other services - especially to rural areas not presently served by cable TV. They want to construct a national broadband telecommunications network with fiber-to-the-home but the costs are multi-billion.

Calling it a "...big waste of taxpayers money", Time-Warner says that it is not necessary to run fiber cables to every home. CLI (Compression Labs, Inc.) and AT&T have developed an interactive TV set-top interface for telephone companies. Time Warner did not say, but they may well incorporate AT&T's Paradyne transmission technology into their system since it permits interactive ISDN (the Integrated Services Digital Network) over copper wires up to 2 miles from fiber-optic "backbones." Their Paradyne transmission technology can deliver VHS-quality video at 1.5 MB/sec. A new digital motion picture standard scheduled to be adopted next month by the International Standards Organization will hasten movies-on-demand.

The big loser in all of this could be video rental stores! But market leader Blockbuster Entertainment Corp. certainly isn't standing still! They want to get into the cable business themselves and are considering a joint venture with telephone companies.

Blockbuster has set up a division to specifically

explore video expansion opportunities including the duplication of video tapes for individual use [*down-linking the programming by satellite and making mass copies at the store*] and video game amusement centers featuring "virtual reality" [*where the player actually participates "inside" and is completely surrounded in 3D by the game*.]

A recent report by Frost & Sullivan (a leading market researcher) predicts that IVDS (*Interactive Video and Data Service*) to households will be a \$200 million dollar business within 3 years. Most of that programming will be games, home shopping and computer databases that can be manipulated by PCs.

Business, educational and retail interactive TV delivered by cable, telephone or satellite will supply another \$1.5 billion by 1996. The technology will activated new start up companies with their own technology, new and existing TV networks, technological upgrades by cable operators, telephone companies and computer networks such as CompuServe and Prodigy.

Several firms already are testing interactive video technology. ACTV allows Canadian and British viewers to choose camera angles in sports events and to participate in fiction programming by choosing potential plots. The Interactive Network (available in San Francisco and Sacramento) uses TV's "vertical blanking interval" and FM radio data broadcasts to show computer graphics. Interactive Systems has 1,000 home tests in progress in the U.S. and several countries overseas. Australia plans to debut a nationwide interactive game show in that country next year.

NTN Entertainment Network, a satellite-delivered computer-graphic gaming network for restaurants, hotels, bars and other public places will shortly expand to cable systems. RTT (Radio Telecom & Technology) is a two-way cellular IVDS system being tested in the suburbs of Los Angeles. Another cellular IVDS system, TV Answer, can be used to program VCRs, shop/bank at home, and request additional information broadcast on standard programming. Hughes Direc-TV uses standard telephone lines to offer interactive video services. With Videoway, viewers can cruise through a supermarket or shopping mall and call up product information as needed.

Expect an interactive battle royal among the entrepreneurs, telcos, broadcast TV, personal computer industry and cable operators. Most involved believe that the best thing the government could do to accelerate the rollout of advanced digital video is to simply get out of the way. Both wired and wireless technologies are digitizing and they want the radio spectrum freed from outdated analog transmission techniques. There is also a call for Congress to revive efforts to transfer 200 MHz of government-controlled spectrum to private-industry use. One thing for certain, the stakes are incredibly high! A lot of money will be made and lost in interactive video as the shakeout continues.